UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

MK

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/431,321	11/02/99	KOBAYASHI Y	325/FP/T-22-

IM12/1222

WENDEROTH LIND & PONACK L L P
2033 K STREET N W
SUITE 800
WASHINGTON DC 20006

EXAMINER	
FEELY, M	
ART UNIT	**PAPER NUMBER**
1741	6

DATE MAILED: 12/22/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/431,321	KOBAYASHI ET AL.	
	Examiner	Art Unit	
	Michael J Feely	1741	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 November 1999* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☒ Claim(s) *21,22,23,25,28,and 30* is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claims 21 and 22 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claim limitations are identical to the alternative claim language of claims 3 and 4 when applied to claim 1.

2. Claims 28 and 30 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 28 fails to limit the "chrome plated part" of claim 27 with the claim language, "wherein the chrome layer is deposited on the surface of the substrate by plating," and claim 30 fails to limit the "chrome plating method" of claim 29 with the claim language, "wherein in the depositing step the chrome layer is deposited on the surface of the substrate by plating."

3. Claims 23 and 25 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 23 and 25 fail to limit claim 5 because they recite the general properties of compressive residual stress and tensile residual stress, which are inherent properties of a cracked chromium layer.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim1-7 and 21-30 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an electroplating method and electroplated part, does not reasonably provide enablement for a "plating" method and a "plated" part. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims. Although the specification describes an electroplated product and electroplating method, Applicant uses general claim language of, "chrome plated part" and "plating method". The scope of the claim language is too broad and must be corrected to reflect the disclosed subject matter in the specification.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, and 27-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Leland (US Pat. No. 3,886,053).

Regarding claim 1, Leland discloses a chrome plated part comprising a substrate having a crack-free chrome layer on the surface thereof, the crack-free chrome layer having compressive residual stress and being formed by plating (column 2, lines 29-39 and 43-48).

Regarding claim 27 and 28, Leland discloses a chrome plated part comprising: a substrate having a surface; and a chrome layer deposited on the surface of the substrate, the chrome layer having compressive residual stress (column 2, lines 29-39 and 43-48).

Regarding claim 29 and 30, Leland discloses a chrome plating method comprising the steps of: providing a substrate having a surface; and depositing a chrome layer of the surface of the substrate so that the chrome layer has compressive residual stress (column 2, lines 29-39 and 43-48).

Examiner considers compressive residual stress to be an inherent characteristic of a crack-free chromium layer.

8. Claims 1, 5, 8, 11, 23, 25, and 27-30 rejected under 35 U.S.C. 102(b) as being anticipated by Kohl et al. (UK Pat. App. 2 236 763 A).

Regarding claim 1, Kohl et al. disclose a chrome plated part comprising a substrate having a crack-free chrome layer on a surface thereof, the crack-free chrome layer having compressive residual stress and being formed by plating (claim 1).

Regarding claim 5, Kohl et al. disclose a chrome plated part according to claim 1, wherein the crack-free chrome layer is a lower chrome layer and the chrome plated part further comprises a cracked upper chrome layer which is formed on the lower chrome layer by plating (claim 6).

Regarding claim 8, Kohl et al. disclose a chrome plating method comprising the step of conducting electroplating of a work in a chrome plating bath by application of a pulse current, the chrome plating bath containing organic sulfonic acid, to thereby deposit a crack-free chrome layer on a surface of the work, the crack-free chrome layer having compressive residual stress (claim 1).

Regarding claim 11, Kohl et al. disclose a chrome plating method according to claim 8, further comprising the step of conducting, after the pulse plating, electroplating of the work in the same chrome plating bath as the chrome plating bath for the pulse plating, by one of adjustment of a waveform of the pulse current and application of a direct current, to thereby deposit a cracked upper chrome layer on the crack-free chrome layer (claim 6).

Regardng claim 23, Kohl et al. disclose a chrome-plated part according to claim 5, wherein the upper chrome layer has compressive residual stress (claim 1).

Regarding claim 25, Kohl et al. disclose a chrome-plated part according to claim 5, wherein the upper chrome layer has tensile residual stress (claim 6).

Regarding claims 27 and 28, Kohl et al. disclose a chrome plated part comprising: a substrate having a surface; and a chrome layer deposited on the surface of the substrate, the chrome layer having compressive residual stress (claim 1).

Regarding claim 29 and 30, Kohl et al. disclose a chrome plating method comprising the steps of: providing a substrate having a surface; and depositing a chrome layer of the surface of the substrate so that the chrome layer has compressive residual stress (claim 1).

Examiner considers compressive residual stress to be an inherent characteristic of a crack-free chromium layer.

Examiner considers compressive residual stress and tensile residual stress to be inherent characteristics of a cracked chromium layer.

9. Claims 1, 5, 23, 25, and 27-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Roggendorf (US Pat. No. 3,661,733).

Regarding claim 1, Roggendorf discloses a chrome-plated part comprising a substrate having a crack-free chrome layer on a surface thereof, the crack-free chrome layer having compressive residual stress and being formed by plating (column 3, lines 45-50).

Regarding claim 5, Roggendorf discloses a chrome plated part according to claim 1, wherein the crack-free chrome layer is a lower chrome layer and the chrome plated part further comprises a cracked upper chrome layer which is formed on the lower chrome layer by plating (column 3, lines 45-50).

Regarding claim 23, Roggendorf discloses a chrome-plated part according to claim 5, wherein the upper chrome layer has compressive residual stress (column 3, lines 45-50).

Regarding claim 25, Roggendorf discloses a chrome-plated part according to claim 5, wherein the upper chrome layer has tensile residual stress (column 3, lines 45-50).

Regarding claims 27 and 28, Roggendorf disclose a chrome plated part comprising: a substrate having a surface; and a chrome layer deposited on the surface of the substrate, the chrome layer having compressive residual stress (column 3, lines 45-50).

Regarding claim 29 and 30, Roggendorf disclose a chrome plating method comprising the steps of: providing a substrate having a surface; and depositing a chrome layer of the surface of the substrate so that the chrome layer has compressive residual stress (column 3, lines 45-50).

Examiner considers compressive residual stress to be an inherent characteristic of a crack-free chromium layer.

Examiner considers compressive residual stress and tensile residual stress to be inherent characteristics of a cracked chromium layer

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-4, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogisu et al. (US Pat. No. 5,837,354).

Regarding claim 1, discloses a chrome plated part comprising a crack-free chrome layer (column 4, lines 37-43), the crack-free chrome layer having compressive residual stress (column 4, lines 42-43 and column 6, lines 6 through column 7, line 5) and being formed by plating (column 8, lines 56-59).

Ogisu et al. are silent regarding the chromium layer being on the surface of the substrate. Rather, Ogisu et al. disclose a flexible substrate that, "consists of a base material 2, a base coat layer 3 formed by applying a coating on the base material 2, a metal thin film layer 4 formed on the base coat layer 3," (column 3, lines 25-29), wherein, "The metal thin film layer 4 having a metallic luster is, for example, chromium having a purity of 99.99%," (column 3, lines 61-62). The base material is a soft resin material; therefore it is necessary to apply the base coat to enhance flexibility and adhesion to the substrate (column 3, lines 31-44). Examiner assumes that

it would have been within the ordinary skill in the art to apply the same chromium layer to a non-flexible/non-coated material.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have produced a chrome plated part comprising a substrate having a crack-free layer on the surface thereof, the crack-free chrome layer having compressive residual stress and being formed by plating because Ogisu et al. teach the production of flexible top-coated substrates with a chrome plated layer resulting in a corrosion resistant flexible metallized product.

Regarding claim 2, Ogisu et al. are silent regarding the compressive residual stress in the crack-free chrome layer of the chrome plated part of claim 1 being 100 MPa or more. However, this threshold is assumed to be inherent of the chrome layer in order for it to remain crack-free.

Therefore, if not explicitly taught in the reference, then the teaching would have been obvious with the ordinary skill of the art at the time of the invention.

Regarding claims 3, 4, 21, and 22, Ogisu et al. disclose a first embodiment, wherein, "The average size of the crystal grains in the metal thing film layer 4 is 200 Å," (20 nm), (column 4, lines 25-26), and a second embodiment, wherein, "an average crystal grain size (is) of 100 Å or less," (10 nm), (column 8, line 30). Ogisu et al. further disclose, "While the metal thing film layers 4, 11 containing crystal grain boundaries 6, 12 are formed by means of vacuum vapor deposition or sputtering in the foregoing embodiments, they may be formed by other means such as ion plating," (column 8, lines 56-59).

Therefore, it would have been obvious to have produced a chrome plated part according to claim 1 or 2 wherein the crack-free chromium layer has a crystal grain size of 9 nm or more and less than 16 nm because Ogisu et al. teach the production of flexible top-coated substrates

with a chrome plated layer with, wherein the average grain size is 200 Å or less than 100 Å resulting in a corrosion resistant flexible metallized product.

12. Claims 3, 4, 21, 22, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kohl et al (UK Pat. App. 2 236 763 A) in view of Ogisu et al. (US Pat. No. 5,837,354).

Regarding claims 3, 4, 21, 22 Kohl et al. are silent regarding a crack-free chrome layer having a grain size of 9 nm or more or less than 16 nm.

Ogisu et al. are as set forth above in claims 1-4, 21, and 22 and incorporated herein. It would have been obvious to one of ordinary skill in the art at the time of the invention to have had a crack-free chrome layer with a crystal grain size of 9 nm or more and less than 16 nm, as taught by Ogisu et al. in the invention of Kohl et al. because Ogisu et al. disclose a crack-free chromium layer with average grain size of 200Å or less than 100Å resulting in a corrosion resistant flexible metallized product.

Regarding claim 26, Kohl et al. are silent regarding a cracked chrome layer having a grain size less than 9 nm.

Ogisu et al. are as set forth above in claims 1-4, 21, and 22 and incorporated herein. It would have been obvious to have applied a chromium layer with a crystal grain size less than 9 nm, as taught Ogisu et al., to the chromium coated article of Kohl et al. because Ogisu et al. teach the deposition of a chromium plated layer with average grain size of 200Å or less than 100Å resulting in a corrosion resistant flexible metallized product.

It may be argued that the chromium coating of Ogisu et al. is drawn to a crack-free coating; however, Examiner assumes that the stress/cracking characteristics of this coating are

controlled by parameters that are within the ordinary skill in the art (Kohl et al.: page 5, lines 25-26).

13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roggendorf (US Pat. No. 3,661,733) or Kohl et al. (UK Pat. App. 2 236 763 A) in view of Nee et al (US Pat. No. 4,869,971).

Roggendorf and Kohl et al. are silent regarding a chrome plated part according to claim 5, further comprising at least one intermediate chrome layer which is formed between the lower chrome layer and the upper chrome layer.

Nee et al. disclose a multi-layer pulsed-current electrodeposition technique, wherein, "It is ordinarily preferred for each group of layers to consist of two layers of distinct materials, although repeating groups of three or more layers may be deposited if desired. The layers within a given group may be distinct from one another in terms of chemical composition, crystal structure, crystal grain size, morphology, or other property," (column 3, lines 4-10). Although the reference focuses on brass deposition, Nee et al. disclose, "the process of the present invention may be used to advantage with conventional electrodeposition solutions." (column 5, lines 21-23).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have produced a chrome plated part according to claim 5, further comprising at least one intermediate chrome layer which is formed between the lower chrome layer and the upper chrome layer by plating, as taught by Nee et al., to the chrome plated part of Roggendorf or Kohl et al. because Nee et al. teach a method of electrodeposition, wherein a conventional electroplating solution is used to apply repeating groups of two or more layers with distinct

physical or chemical properties resulting in electrodeposition with outstanding mechanical and other properties.

14. Claims 9, 10, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kohl et al (UK Pat. App. 2 236 763 A).

Regarding claims 9 and 10, Kohl et al. are silent regarding a chrome plating method according to claim 8, wherein the compressive residual stress in the crack-free chrome layer is set to a level of 100 MPa or more by adjusting a waveform of the pulse current. Kohl et al. are also silent regarding the method wherein the crack-free chrome layer is formed to have crystal grain size of from 9 nm to less than 16 nm by adjusting a waveform of the pulse current. Adjustment of the waveform of the pulse current is drawn to the optimization of the process. Kohl et al. discloses, "It is obviously possible under the invention to use the widest variety of pulse forms," (page 5, lines 25-26). Examiner assumes that any pulse plating system could be adjusted to achieve the desired compressive residual stress and/or crystal grain size. Furthermore, it has been found that, "where the general conditions of the claim are disclosed in the prior art, it is not inventive to discover the optimum working conditions by routine experimentation," – In re Boesch, 205 USPQ 215. In order to overcome obviousness, applicants must show criticality of ranges resulting in new and unexpected results over the prior art.

Therefore, although the teachings were not explicitly taught in the references, it would have been obvious to one of ordinary skill in the art at the time of the invention to establish process parameters to achieve desired compressive residual stress and crystal grain size.

Regarding claims 13 and 14, the teachings of Kohl et al. are drawn to a batch operation. In addition, it has been found that a, "continuous operation would have been obvious in light of the batch process of the prior art," – In re Dilnot, 138 USPQ 248.

Therefore, although the teachings were not explicitly taught in the references, it would have been obvious to one of ordinary skill in the art at the time of the invention to operate the process in either a batch or continuous mode.

15. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kohl et al. (UK Pat. App. 2 236 763 A) in view of Nee et al (US Pat. No 4,869,971).

Regarding claim 12, Kohl et al. are silent regarding a chrome plating method according to claim 8, further comprising the steps of depositing an intermediate chrome layer using the same chrome plating bath on top of the crack-free la yer and depositing a cracked layer on the intermediate layer.

Nee et al. disclose, "A process for electrodepositing a multi-layer deposit on an electrically-conductive substrate from a single electrodeposition bath yields a deposit which includes a sequence of essentially repeating groups of layers," (Abstract) wherein, "the process includes the steps of immersing the substrate in an electrodeposition bath and repeatedly passing a charge burst of a full electric current and a second electric current through the electrodeposition bath to the substrate. The first electric current is a pulsed current with a first pulsed on/off waveform and a first peak current density which is effective to electrodeposit the first electrodeposited material. The second electric current has a second waveform and a second current density which is effective to electrodeposit the second electrodeposited material," (Abstract). Nee et al. further disclose, "repeating groups of three or more layers may be

deposited if desired. The layers within a given group may be distinct from one another in terms of chemical composition, crystal structure, crystal grain size, morphology, or other property," (column 3, lines 6-10). Although Nee et al. primarily focus on the deposition of a brass-alloy, they disclose, "The process of the present invention may be used to advantage with conventional electrodeposition solutions," (column 5, lines 20-22). Examiner assumes that a chromium plating bath containing organic sulfonic acid meets the standard of "conventional electroplating solution."

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have applied an intermediate layer and a cracked layer on a crack-free chromium layer via pulse current waveform using the same chrome plating bath, as taught by Nee et al., in the method of Kohl et al. because Nee et al. teach the general method of electrodepositing a multi-layer deposit on an electrically-conductive substrate using a single bath of conventional electrodeposition solution and varied wave forms of pulse current resulting in the formation of layers that may be distinct from one another in terms of chemical composition, crystal structure, crystal grain size, morphology, or other structure.

16. Claims 7 and 15-20 are rejected under 35 U.S.C. 103(a)as being unpatentable over the Kohl et al. (UK Pat. App. 2 236 763 A) in view of Leland (US Pat. No 3,886,053) and Szupillo (US Pat. No. 3,616,349).

Regarding claims 7 and 15-20, Kohl et al. are silent regarding a post treatment step of polishing the crack-free or cracked chromium layer and further heat oxidizing the upper chromium layer by means of a baking process or high-frequency heating.

Leland discloses a method of producing a crack-free chromium layer further comprising the step of polishing the crack free chrome layer on the surface of the work (column 2, 29-39). However, Leland is silent regarding the step of conducting heat oxidation, by means of a baking process or high-frequency heating, to thereby form an oxide film containing Cr_2O_3 on a surface of the crack free chrome layer.

Szupillo discloses a method for etching chromium oxide films wherein, "a workpiece 10 consisting of a substrate 12 such as glass, ceramic material, or the like, a thin coating of chromium film 14 applied to the substrate 12 by any well known method," (column 2, lines 16-19) and, "As is well known to those skilled in the art, the chromium film 14 readily forms a thin surface oxide layer 20 when the film 14 is exposed to air during the normal process of handling the workpiece 10," (column 2, lines 32-35).

Szupillo is silent regarding a heat treatment process for the chromium layer. However, since Szupillo teaches that chromium film readily forms a thin surface oxide layer when exposed to air during the normal process of handling the workpiece, the criticality and/or necessity of this heating step is unclear. The prior art is silent regarding the post-treatment heat oxidation technique. Examiner assumes this technique is not disclosed due to the inherent ability of the chromium layer to form an oxide layer when exposed to an oxygen-rich environment. Applicant discloses this heating treatment to be performed at approximately 200°C (specification: page 20, line 19). However, since the plated surface is exposed oxygen regardless of temperature conditions, this step is drawn to an optimization technique. It has been found that, "where the general conditions of the claim are disclosed in the prior art, it is not inventive to discover the optimum working conditions by routine experimentation," – In re Boesch, 205 USPQ 215. In

order to overcome obviousness, applicants must show criticality of ranges resulting in new and unexpected results over the prior art.

Therefore, although the teachings were not explicitly taught in the references, it would have been obvious to one of ordinary skill in the art at the time the invention to have formed a chromium oxide layer on a polished chromium layer by means of heat treating, whether it was performed with a baking process or with high-frequency heating.

Claim Rejections - 35 USC § 102/ 35 USC § 103

17. Claim 2 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Leland (US Pat. No. 3,886,053), or Kohl et al. (UK Pat. App. 2 236 763 A), or Roggendorf (US Pat. No. 3,661,733).

Leland, Roggendorf, and Kohl et al. are silent regarding the compressive residual stress in the crack-free chrome layer of the chrome plated part of claim 1 being 100 MPa or more. However, this threshold is assumed to be inherent of the chrome layer in order for it to remain crack-free.

Therefore, if not explicitly taught in the reference, then the teaching would have been obvious with the ordinary skill of the art at the time of the invention.

18. Claim 24 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Roggendorf (US Pat. No. 3,661,733) or Kohl et al. (UK Pat. App. 2 236 763 A).

Roggendorf and Kohl et al. are silent regarding the compressive residual stress in the cracked chrome layer of the chrome plated part of claim 1 being less than 100 MPa. However, this threshold is assumed to be inherent of the chrome layer in order for it to crack.

Therefore, if not explicitly taught in the reference, then the teaching would have been obvious with the ordinary skill of the art at the time of the invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Feely whose telephone number is 703-305-0268. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kathryn Gorgos can be reached on 703-308-3328. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Michael J Feely
December 11, 2000

Kathryn Gorgos
Supervisory Patent Examiner
Technology Center 1700